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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,647	02/11/2004	Hardayal Singh Gill	HIT1P064/HSJ920030278US1	1941

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EXAMINER

BLOUIN, MARK S

ART UNIT PAPER NUMBER

2627

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/25/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/777,647

Applicant(s)

GILL, HARDAYAL SINGH

Examiner

Mark Blouin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/20/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 20, 2006 has been entered.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frietag et al (USPN 6,785,102) in view of Pinarbasi (USPub 2003/0179515).

3. Regarding Claims 1,8,10, and 18-20, Frietag et al shows (Figs. 1-7 and 10) a magnetic storage system, comprising magnetic media, at least one head for reading from and writing to the magnetic media, each head having a sensor, a writer coupled to the sensor, a slider for supporting the head; and a control unit coupled to the head for controlling operation of a dual magnetic tunnel junction head, comprising a free layer (F1,F2,F3) having a thickness of less than about 30A, first (AP1) and second (AP2)

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antiparallel (AP) pinned layer structures positioned on opposite sides of the free layer, each of the AP pinned layer structures including at least two pinned layers having magnetic moments that are self-pinned (Col2, line 57) antiparallel to each other, the pinned layers being separated by an AP coupling layer (APC, 212), a first barrier layer (S1 - 204) positioned between the first AP pinned layer structure and the free layer, a second barrier layer (S2 - 206) positioned between the second AP pinned layer structure and the free layer, wherein the head has a thickness of less than about 500Å, wherein the head does not have an antiferromagnetic layer.

Frietag et al does not show the first and second barrier layers formed of a dielectric material (insulator).

Pinarbasi shows [0039] a barrier layer (206) formed of a dielectric material (insulator, nonconducting).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace barrier layers of Frietag et al with the dielectric, nonconducting barrier layer as taught by Pinarbasi. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to replace barrier layers of Frietag et al with the dielectric, nonconducting barrier layer as taught by Pinarbasi in order to establish a higher amplitude read output, since spin valves and tunnel junctions (MR sensors) are art equivalent methods for reading data.

4. Regarding Claims 2 and 11, Frietag et al shows (Fig. 10) a head, wherein the free layer includes a layer of NiFe (F1, (250)).

5. Regarding Claims 3 and 12, Frietag et al shows (Fig. 10) a head, wherein the free layer further includes layers of CoFe (252,254) sandwiching the layer of NiFe.

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6. Regarding Claims 4 and 13, Frietag et al shows (Fig. 10) a head, wherein the AP pinned layer structures have about the same magnetic thickness.
7. Regarding Claims 5 and 14, Frietag et al shows (Fig. 10) a head, wherein the free layer has a thickness of less than about 30A.
8. Regarding Claims 6 and 15, Frietag et al shows (Fig. 10) a head, wherein the free layer has a thickness of between about 15 and 25A.
9. Regarding Claims 7 and 16, Frietag et al shows (Fig. 10) a head, wherein a half voltage of the head is more than two times greater than a half voltage of a head having a substantially similar structure but having only one barrier layer (inherent – $V = IR$).
10. Regarding Claims 9 and 17, Frietag et al shows (Fig. 10) a head, wherein the head has a thickness of less than about 300A.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Blouin whose telephone number is 571-272-7583. The examiner can normally be reached on M-F from 6:00 to 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Hoa Nguyen, can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

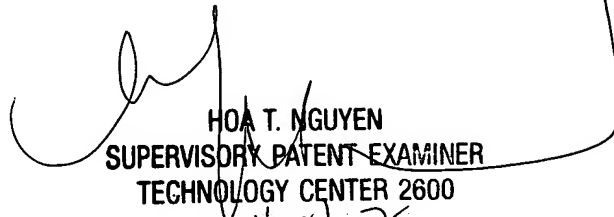
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you

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have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Mark Blouin
Patent Examiner
Art Unit 2653
January 8, 2007



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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600
1/18/07